for seven days, their organs, other than those operated on, not only assuming their typical shape and correlative arrangement, but also undergoing typical histogenic differentiation. Dr. Schaper considers that his experiments corroborate the theories of Roux, who divides the development of an organism into an early period of organogenetic development and a later period of functional development. During the first period the organs develop by means of an inherited endogenous energy without influence from outer stimuli; during the second the gradually developed specific function of the individual organ, as well as the cooperative function of all the organs of the body, are the main stimuli for further growth. During this second period the absence of an important organ, and especially of the central nervous system, must be fatal and lead to the death of the organism.

Two investigators have recently used the Röntgen rays to very good purpose. The first of these, Professor H. C. Bumpus, was, by their aid, enabled to note accurately the number of vertebræ, and record the position of the pelvis in 100 specimens of *Necturus*. The other, Dr. W. C. Cannon, used the rays to obtain figures showing the changing shape of the stomach during digestion, using for the purpose a cat. The animal's food was mixed with subnitrate of bismuth and the wave-like movements of the pyloric portion of the stomach were made clearly visible. The total number of waves which passed over the antrum during the seven hours a cat was digesting a meal of soft bread was about 2,600.

Professor Bumpus's paper, alluded to above, can hardly be summarized, owing to the number of questions discussed and amount of evidence brought forward. It may, however, be said that in 36 out of 100 examples of *Necturus* the pelvis was abnormally attached, and that in 22 cases it was attached to the twentieth instead of the nineteenth vertebra. Variations in the relative position of the pelvic arch are associated with variations in the position of the pectoral arch; the definitive location of the pelvis is probably due to centripetal influence derived from the budding appendage, and intercalation of vertebræ in the sense of the introduction of new segments does not take place. F. A. L.

CURRENT NOTES ON PHYSIOGRAPHY.

THE MISSISSIPPI FLOOD OF 1897.

Weather Bureau Bulletin E, 'Floods of the Mississippi River,' by Park Morrill, is a report on an important subject concerning which most persons have only newspaper information. Forty-five quarto pages are given to a general account of the river, its flood plain and some of its earlier floods. Thirty pages describe the spring flood of 1897. Many charts represent the normal monthly precipitation of the region, certain cases of exceptional precipitation, and records of hydrographs during floods at various stations. Among the most interesting plates is one (based on the Mississippi River Commission map) representing the flooded area of 1897 and its relation to the 'alluvial valley' or flood plain of the lower Mississippi. The manner in which the flood avoided the higher ground along the river and selected the back swamps at one or the other side of the flood plain is very clearly brought out. As is well known, the great river follows near the eastern bluffs as far as Memphis, then swings across to the western bluffs at Helena, and returns to the eastern bluffs at Vicksburg, remaining close to them as far as Baton Rouge. The flood began in the St. Francis basin, west of the river, in the Memphis section. It crossed the river near Helena, submerging the lower Yazoo basin, but leaving the upper Yazoo basin free. The flood again crossed the river near Vicksburg, submerging the lower Macon basin, but

leaving the upper basin free. Thence to the Gulf it followed the western back swamps, the main river not overflowing below Vicksburg. The safety of the upper Yazoo basin resulted not alone from the high ground along the Mississippi, but also from the belt of high unfloodable ground that divides the upper Yazoo and the Sunflower basins. This belt is mentioned in the text as an extension of Crowley's ridge (on the west side of the Mississippi, above Helena). It is truly in line with Crowley's ridge, but the two are probably of altogether different origins. Crowley's ridge is an isolated part of the uplands that border the flood plain on the west (see SCIENCE, I., 1895, 605); but the unfloodable belt between the Yazoo and the Sunflower probably marks a former aggraded path of the Mississippi, deserted at the time of some ancient flood.

THE FIJI CORAL REEFS.

A LETTER from Alexander Agassiz, on 'The Islands and Coral Reefs of the Fiji Group' (*Amer. Journ. Sci.*, V., 1898, 113–123), presents matter of much importance in connection with theories of reef formation. Instead of finding, as was expected from the accounts by Darwin and Dana, that a progressive subsidence would account for the barrier reefs of the Fiji group, numerous elevated reefs were seen at heights of 600 to 800 feet; and a number of barrier reefs and atolls were discovered to be only the denuded remnants of reefs formerly elevated. Boring into the reefs was regarded as unnecessary, for the natural sections exposed by the elevated reefs revealed their structure clearly. While the elevated reef deposits may have been formed during a period of subsidence, that movement cannot be included in the present geological period, nor can it account for the existing distribution of reefs at sea-level, where recent coral growth is thought to have added only a relatively thin crust to a pre-existent mass. A possible relation of circular or oval atolls to a foundation upon the worn-down rim of a large volcanic crater (caldera) is suggested; calderas being of frequent occurrence, and having outlines and dimensions similar to those of reefs near by.

The separation of the smaller volcanic islands from the larger ones in the Fiji group is taken as evidence of long continued denudation, largely by the sea, after the uplift of the region. The possibility of some of this separation being due to subsidence is not explicitly considered. The importance of subsidence in the formation of reef deposits may still be maintained, but in the Fiji group it seems to have little bearing on present reef outlines.

THE MAZAMAS.

THE Mazamas, a society of practical mountaineers organized on the summit of Mt. Hood, in July, 1894, hold their annual meetings on mountain tops and publish their proceedings in '*Mazama*, a record of mountaineering in the Pacific Northwest' (Portland, Oregon); numbers for 1896 and 1897 having been issued. The second is the Crater Lake number, which gives a most enjoyable account of the gathering there in 1896, already noted in SCIENCE (June 18, 1897). Essays on the discovery, geography, geology, botany, zoology and bibliography of Crater Lake, with many illustrations from photographs, make this number of high value, deserving of earlier mention than in this belated note.

W. M. DAVIS.

CURRENT NOTES ON METEOROLOGY.

METEOROLOGICAL OBSERVATIONS DURING THE ECLIPSE OF JANUARY 22.

THE meteorological observations made at Viziadurg during the eclipse of January 22d, as noted by Mr. J. Eliot, Meteorological Reporter to the Government of India,